REMARKS

As a preliminary matter, Applicant notes that the Examiner has not acknowledged the claim for foreign priority or receipt of the priority document, which was filed August 18, 2000. Also, the Examiner has not indicated the status of the drawings. Hence, the Applicant respectfully requests the Examiner to do so.

Claims 1-28 are all the claims pending in the application.

Claims 1, 2, 8, 9, 15, 16, 22, and 23 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Neitzel et al. (US 5,550,888, hereafter "Neitzel") in view of Geddes et al. ("Principles of Applied Biomedical Instrumentation," hereafter "Geddes").

Claims 1 and 15 are also rejected under 35 U.S.C. § 112, second paragraph, as being indefinite.

Claims 3-7, 10-14, 17-21, and 24-28 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including the limitations of the base claim and any intervening claims.

Regarding the indefiniteness rejection of claims 1 and 15, the present Amendment includes non-narrowing amendments of claims 1 and 15, which should remove the indicated antecedent basis problems.

With respect to the indefiniteness rejection of claims 1 and 15, Applicant has the following comments. Claims 1 and 15 recite a low signal value region and an intermediate and high signal value region. These regions are described in the specification at pages 12-13, for example, in reference to FIG. 2A. As described there, FIG. 2A shows a graph of the logarithmic

brightness Y output by a brightness circuit versus the input image signal S. The signal S in FIG. 2A is shown as ranging from 0 to 100%, where 100% corresponds to S_{max}. Thus, the signal S has lower values toward the left of the graph and higher values toward the right of the graph. The boundary between the low signal value region and the intermediate and high signal value region is designated as S_a, at which point a dashed line is shown. The output brightness characteristic of these regions is clearly described in the present specification at page 12, line 22 - page 13, line 13. Hence, we would submit that claims 1 and 15 are definite.

Turning to the prior art rejections, Applicant respectfully submits that the applied references do not teach or suggest all of the limitations of the claims. Specifically, the references do not disclose the limitations of claim 1 of setting the output brightness characteristic so that a rate of change, which represents a change in a logarithmic value of the output brightness with respect to a change in the input image signal value, in a low signal value region of the image signal becomes smaller than that in an intermediate and high signal value region of the input image signal.

As noted by the Examiner, Neitzel discloses:

> The individual data words of the data set thus corrected are subjected to a logarithmic transformation (block 9), preferably by means of a look-up table, in conformity with the formula $E=\log D/D_0$, where D_0 is a reference dose which is derived in known manner from the contents of the image, for example by histogram analysis.

In other words, Neitzel discloses performing a logarithmic transformation on the image data. However, such a disclosure does not teach or suggest the aforementioned limitations of claim 1. The Examiner admits that Neitzel does not explicitly disclose the boundary conditions for a low

signal value region and an intermediate and high signal value region, but asserts that Geddes makes up for the deficiencies of Neitzel. Applicant disagrees.

The figures of Geddes cited by the Examiner disclose the Lapicque strength-duration curve for current (FIG. 2(a)) and strength-duration curves for various excitable tissues (FIG. 2(b)). In other words, these figures show how the current applied to various tissues changes over time. Thus, the disclosure of Geddes does not teach or suggest, or even relate to, an image display method, an output brightness characteristic, or signal value regions of an input image signal. Moreover, Geddes discloses a current changing over time, while claim 1 recites a change in a logarithmic value of output brightness with respect to a change in the input image signal value. Furthermore, Geddes discloses that the rate of change in the current is larger at lower duration times. Thus, even if the teachings of Geddes were to be combined with the teachings of Neitzel, the combination of references would fail to teach or suggest all of the limitations of claim 1.

Additionally, Applicant submits that there is no suggestion or motivation to combine the teachings of Geddes with the teachings of Neitzel. As noted above, the disclosure of Geddes relates to the Lapicque strength-duration curve for current and strength-duration curves for various excitable tissues. Neitzel, however, relates to an apparatus and method of displaying x-ray images. Due to the disparate teachings of these references, it appears very likely that it would not have been obvious to one of ordinary skill in the art at the time of the invention to have combined the references.

Therefore, claim 1 and its dependent claims 2-14 are allowable over the prior art, for at least the above-noted reasons.

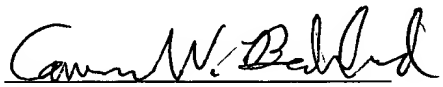
Likewise, claim 15 and its dependent claims 16-28 are allowable over the prior art for reasons analogous to those presented in relation to claim 1.

Also, the specification is amended to correct the indicated figure numbers.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



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APPENDIX

VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE SPECIFICATION:

The specification is amended as follows:

Page 2, second full paragraph:

On the other hand, the X-ray film, as shown in Fig. 4A, exhibits an output brightness characteristic in which an input image signal S and its output density D are approximately linear, but the sensitivity of the output density D with respect to the input image signal S is reduced at the low signal value region. Also, when viewing an image recorded on X-ray film of such an output brightness characteristic, with the film held to the schaukasten, an image portion of high density is recognized as an image portion of low brightness and an image portion of low density is recognized as an image portion of high density, as shown in Fig. 4B. Therefore, for the image viewed with the X-ray film held to the schaukasten, the sensitivity of the output brightness (logarithmic value) to the value of an input signal becomes lower in the low signal value region corresponding to the image portion of low density than in other intermediate and high signal value regions.

Pages 12-13, paragraph bridging pages:

The output brightness characteristic of the brightness circuit 11 is a characteristic in which the logarithmic value Y (= log(L)) of the output brightness L becomes smaller as the value of the input image signal S becomes larger, as shown Fig. [1]2A. A rate of change $|G_{0\text{-}a}|$ (=$|\Delta Y/\Delta S|$: absolute value of the differentiated value of Y with respect to the differentiated value

of S), which represents a change in the logarithmic value Y of the output brightness L with respect to a change in the image signal S, in the low signal value region of the image signal S ($0 \leq S \leq S_a$) is set smaller than a rate of change $|G_{a\text{-}100}|$ in the intermediate and high signal value region of the image signal ($S_a < S$)($|G_{0\text{-}a}| < |G_{a\text{-}100}|$). Note that the boundary value S_a between the low signal value region and the intermediate and high signal value region is set to a value in the range of the following Eq. 1'. For instance, it is set to $S_a = 0.18 \times S_{max}$ where S_{max} represents the maximum value of the image signal in the output brightness characteristic.

IN THE CLAIMS:

The claims are amended as follows:

1. (Amended) An image display method, which has an output brightness characteristic in which a logarithmic value of an output brightness becomes smaller as a value of an input image signal becomes larger, for displaying a visible image that said input image signal represents according to said output brightness characteristic, the image display method comprising the step of:

setting said output brightness characteristic so that a rate of change, which represents a change in a logarithmic value of said output brightness with respect to a change in said input image signal value, in a low signal value region of said image signal becomes smaller than that in an intermediate and high signal value region of said input image signal.

15. (Amended) In an image display unit, which comprises a brightness circuit having an output brightness characteristic in which a logarithmic value of an output brightness becomes smaller as a value of an input image signal becomes larger, for displaying a visible image that said input image signal represents according to said output brightness characteristic,

the improvement wherein said output brightness characteristic in said brightness circuit is set so that a rate of change, which represents a change in the logarithmic value of said output brightness with respect to a change in said input image signal value, in a low signal value region of said image signal becomes smaller than that in an intermediate and high signal value region of said input image signal.